REMARKS/ARGUMENTS

Claims 1, 3-13, and 19-23 are pending in the present application. The Examiner has previously withdrawn from consideration claims 14-18 based on a constructive election. Claims 1, 3-13, and 19-23 stand rejected under 35 U.S.C. § 103(a). Applicants respectfully request reconsideration of the present application in view of this response.

35 U.S.C. § 103(a) Rejections

Claims 1, 3-5, 7-13, and 19-22 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over United States Patent No. 5,393,351 to Kinard et al. (Kinard) in view of United States Patent No. 5,965,811 to Kawai et al. (Kawai) or United States Patent No. 5,237,867 to Cook, Jr. (Cook). Applicants respectfully traverse for the following reasons.

In order for a claim to be rejected for obviousness under 35 U.S.C. § 103(a), not only must the prior art **teach or suggest each element of the claim**, but the prior art must also **suggest combining the elements in the manner contemplated by the claim**. See Northern Telecom, Inc. v. Datapoint Corp., 908 F.2d 931, 934 (Fed. Cir. 1990), cert. denied, 111 S. Ct. 296 (1990); In re Bond, 910 F.2d 831, 834 (Fed. Cir. 1990). The Examiner bears the initial burden of establishing a *prima facie* case of obviousness. M.P.E.P. §2142. To establish a *prima facie* case of obviousness, the Examiner must show, *inter alia*, that there is some **suggestion or motivation**, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, **to modify or combine the references** and that, when so modified or combined, the prior art **teaches or suggests all of the claim limitations**. M.P.E.P. §2143. Applicants respectfully submit that these criteria for obviousness are not met here.

Independent claim 1 relates to a mass flow sensor that includes, *inter alia*, a frame, **a metal layer including a first structure and a second structure and being arranged above the frame, a heating element formed by the first structure in the metal layer, at least one temperature measurement element formed by the second structure in**

the metal layer, and a moisture barrier arranged above the metal layer and formed at least in part by a nitride layer. As stated in the specification, the stability of the membrane of a mass flow sensor may be improved, for example, by arranging a moisture barrier above the metal layer of the mass flow sensor, as recited in claim 1. (Specification, page 1, lines 12-14). In addition to providing improved stability, the moisture barrier is operable to reduce an amount of damaging moisture that may reach the membrane of the mass flow sensor. (Specification, page 1, lines 17-20). For this purpose, the moisture barrier may include, for example, a nitride layer produced by an LPCVD or PECVD process, or a silicon carbide layer produced by a PECVD process. (Specification, page 2, lines 1-5).

The Office Action asserts that Kinard discloses the claim 1 feature of the "metal layer including a first structure and a second structure and being arranged above the frame," in which a heating element is formed by the first structure and at least one temperature measurement element is formed by the second structure. The Kinard reference purportedly concerns inexpensive multi-junction thermal converters. (Kinard, Abstract). However, Kinard does not discuss, or even suggest a metal layer including the claimed structures of claim 1. Thermopiles 208 and 210 and heater element 206 of Kinard are not **layers** and do not form a **layer** in combination. (Kinard, Figure 3). The legs of the thermocouples which provide the thermopiles of Kinard are sputter-deposited "Chromel" (Kinard, col. 7, ll. 49-56), whereas the heater of Kinard is sputter-deposited "Evanohm" (Kinard, col. 8, ll. 1-7). These two distinct deposition operations preclude the two structures from being part of a single metal layer. This conclusion is reinforced by the discussion in Kinard that the elongated linear heat element is close to, but physically separate from, the hot junctions of the thermopiles. (Kinard, col. 10, ll. 41-46). It is therefore respectfully submitted that Kinard does not disclose, or even suggest, a metal layer including a first structure and a second structure in which a heating element is formed by the first structure and at least one temperature measurement element is formed by the second structure.

The Office Action does not rely on either of Kawai or Cook for disclosing, or suggesting, the above-discussed feature of the metal layer recited in claim 1, and it is respectfully submitted that the addition of these references does not cure the critical

deficiency of Kinard. For at least these reasons, claim 1 is allowable over the combination of Kinard in view of Kawai or Cook. Claims 3-5 and 7-13 depend from claim 1 and are therefore allowable for at least the same reasons that claim 1 is allowable.

Claim 19 relates to a mass flow sensor that includes, *inter alia*, a metal layer arranged above the frame, a heating element formed by a first structure in the metal layer, and at least one temperature measurement element formed by a second structure in the metal layer. As discussed above with respect to claim 1, the Kinard reference does not disclose, or even suggest, a heating element formed by a first structure in the metal layer, and at least one temperature measurement element formed by a second structure in the metal layer.

The Office Action does not rely on either of Kawai or Cook for disclosing, or suggesting, the above-discussed feature of claim 19, and it is respectfully submitted that the addition of these references does not cure the critical deficiency of Kinard as applied against claim 19. For at least these reasons, claim 19 and its dependent claims 20-22 are allowable over the combination of Kinard in view of Kawai or Cook, whether considered individually or in combination.

Claims 6 and 23 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Kinard in view of Cook or Kawai, and further in view of United States Patent No. 5,852,239 in view of Sato et al. (Sato). Applicants respectfully submit that this rejection should be withdrawn for the following reasons.

Claim 6 depends from claim 1. Furthermore, the Office Action does not rely on Sato for disclosing, or suggesting, the claim 1 feature of the heating element being formed by a first structure in the metal layer, and at least one temperature measurement element being formed by a second structure in the metal layer. It is respectfully submitted that the addition of the Sato reference does not cure the previously-discussed critical deficiency of Kinard, Cook and Kawai as applied against parent claim 1. For these reasons, Applicants respectfully submit that dependent claim 6 is allowable over the combination of the applied references for at least the same reasons discussed above in support of the patentability of claim 1.

Independent of the above, neither Kinard nor Sato, whether considered individually or in combination, discloses a moisture barrier "formed at least in part by at least one of a top sandwich system and a bottom sandwich system," in which "at least one of the top sandwich system and the bottom sandwich system includes at least one silicon carbide layer," as recited in claim 6. As regards Kinard, Kawai, and Cook, these references do not disclose or teach the use of silicon carbide for any purpose whatsoever, much less for the purpose of providing a "moisture barrier." As regards Sato, although this reference discusses the etching of a silicon carbide layer to form three heating elements, the reference fails to disclose the use of silicon carbide to form a **moisture barrier** arranged above a metal layer. Considering that the primary purpose of a moisture barrier, for example, a moisture barrier made of silicon carbide, is to prevent the penetration of moisture into the sensor membrane, etching the silicon carbide layer of Sato to produce the heating elements would presumably permit moisture to penetrate the substrate of Sato. That is, after the silicon carbide is etched away, moisture may penetrate the substrate of Sato in areas not occupied by the heating elements. As such, the etched silicon carbide of Sato cannot be considered a "moisture barrier" made of silicon carbide, as recited in claim 6.

Since none of Kinard, Kawai, Cook, and Sato discusses the use of a silicon carbide moisture barrier, there is simply no motivation, suggestion or expectation of success to modify Kinard, Kawai, and Cook with the silicon carbide layer of Sato in the manner contemplated by claim 6. For at least these additional reasons, claim 6 is allowable over the combination of Kinard, Kawai, Cook, and Sato.

Claim 23 depends from claim 19, and the addition of Sato does not cure the critical deficiencies of Kinard, Kawai and Cook as applied against parent claim 19. Therefore, claim 23 is allowable over the applied references for at least the same reasons that claim 19 is allowable. Additionally, claim 23 recites the additional features that at least one of the top and bottom sandwich systems includes a silicon carbide layer. As discussed above in support of allowability of claim 6, since none of Kinard, Kawai, Cook, and Sato discusses the use of a silicon carbide moisture barrier, there is simply no motivation, suggestion or expectation of success to modify Kinard, Kawai, and Cook with the silicon carbide layer of

Sato in the manner contemplated by claim 23. For at least this additional reason, claim 23 is allowable over the applied references.

For at least the foregoing reasons, it is kindly requested that the rejections of claims 1, 3-13, and 19-23 under 35 U.S.C. § 103(a) be withdrawn.

CONCLUSION

Applicants respectfully submit that all of the pending claims of the present application are now in condition for allowance. Prompt reconsideration and allowance of the present application are therefore earnestly solicited.

Respectfully submitted,

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3